

S
Insect Control
District 6

FILE COPY FOREST INSECT LAB. STANFORD UNIVERSITY CALIFORNIA

PRELIMINARY ESTIMATES
On
PROPOSED INSECT CONTROL PROJECTS
on the
NATIONAL FORESTS OF OREGON AND WASHINGTON

December 20, 1923.


A. J. Jaenicke
Forest Examiner.

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GENERAL STATEMENT

During 1923, the writer made a general forest insect survey of the Colville, Chelan, and Wenatchee National Forests in eastern Washington, and of the Fremont and Deschutes National Forests in Oregon. In addition, a very limited study was made of the insect conditions in the vicinity of Diamond Lake on the Umpqua National Forest, and of the northern portion of Crater Lake National Park. This field work revealed four situations worthy of consideration from the control standpoint. These proposed projects are listed in the order of their desirability and urgency, as follows:-

1. The Metolius project in the northern part of the Deschutes National Forest. - This is a brevicomis infestation in yellow pine of high quality and immediate marketability. It is estimated that \$7,900.00 will be needed in the spring of 1924 to handle this project. Cooperation from private owners amounting to less than \$200.00 is involved.

2. The Fork Rock project in the Fort Rock ranger district of the Deschutes National Forest. - This is a brevicomis infestation in yellow pine of good quality, average value, and marketable within ten years. It is estimated that \$8,075.00 will be needed in the spring of 1924 to handle this project. The cooperation of private owners to the extent of \$4,750 will be required to carry the cost of the control work on the private lands within the project area.

3. The Grade Creek project near Lake Chelan on the Chelan National Forest. - This is a mixed brevicomis and monticolae infestation in yellow pine of good quality and lower than average in value because of inaccessibility to manufacturing points and to market. It is estimated that \$4,800 will be needed in the spring of 1924 to handle this project. No private timber is involved.

4. The Crater National Park-Umpqua National Forest project in the general vicinity of Diamond Lake. - This is a monticolae infestation in lodgepole which further threatens scenic values on the Crater National Park and the Umpqua National Forest. Using preliminary Bureau of Entomology data as a basis, Superintendent C. G. Thomson of the Crater National Park has submitted an estimate of \$15,000 for the fiscal year 1924, and \$15,000 for the fiscal year 1925. At least equal

amounts will be needed to handle the National Forest portion of the lodgepole infestation.

Maps of the areas included by these four projects will be found in the envelope attached to this report.

The data on the Deschutes and Chelan projects, particularly as to the areas involved, the costs of initial control work, the severity of past and present insect losses, and timber values to be protected, are believed to be adequately accurate for decision as to the desirability and feasibility of control operations in the spring of 1924. The project on the Umpqua National Forest and the Crater National Park was studied in a very general and preliminary way by the Bureau of Entomology, especially the portion of the infestation on the Umpqua National Forest. The information on the other three projects was secured by the writer and it has not been reviewed by the Bureau of Entomology, either in the field or in the office. However, the data were discussed very informally with Messrs. J. M. Miller and F. P. Keen.

The control operations on the Southern Oregon-Northern California project for the spring of 1924, and the maintenance work on that project after July 1, 1924 have been sufficiently covered by the Bureau of Entomology in reports already in the hands of the Forester. This project is, therefore, not discussed here.

THE METOLIUS PROJECT
on the
Deschutes National Forest

I. Acreage.

National Forest	25,000
Private	500

II. Timber Resources.

Yellow Pine

National Forest	240,000,000 ft. B.M.
Private	500,000 ft. B.M.

The timber included in this project is of high quality. It is saleable at any time at stumpage rates in excess of \$4.00.

III. Past Losses and Present Infestation.

Dendroctonus brevicornis has been responsible for the death of at least 20,000,000 board feet of yellow pine on the area during the period 1916-1923 inclusive, an interval of 8 years. Group infestation is now prevalent in the area, and thrifty, vigorous timber of merchantable size is being killed.

There are sections on which over 100 trees, averaging 900 board feet per tree, are at present infested. The average overwintering infestation for the project as a whole amounts to 50 trees per section, and the trees average 900 board feet each. On this basis, the infestation on the proposed project is as follows:-

National Forest	1950 trees	1,755,000bd.ft.
Private	35 trees	32,000 " "

It is believed that the infestation is in an increasing status. Although the beetle activity is not now as great as it was several years ago, the tendency toward group infestation is indicative of a renewal of a severe epidemic. The 1923 beetle loss is estimated to be over 3,500,000 board feet.

IV. Cost and Desirability of Control.

The timber is largely in fairly level country well supplied by roads and good camping places. The towns of Sisters and Bend are readily accessible as centers of supplies and labor.

In many parts of the project area, reproduction is so abundant that the burning of the infested trees will have to be conducted carefully. The control costs, taking the above factors into consideration, are estimated to be \$4.50 per thousand board feet. Using this figure as a basis, the control costs for the spring of 1924 are as follows:-

National Forest	\$7,900.00
Private	150.00

Because of the high value and marketability of the timber in the Metolius project, because of the menacing character of the existing infestation, and because of the small area of private land included in the project, this project is considered more desirable than any of the other three projects discussed in this report.

THE FORT ROCK PROJECT
on the
DESCHUTES NATIONAL FOREST

I. Acreage.

National Forest	38,000	acres
Private	23,000	acres

The private ownership is largely in the hands of three companies.

II. Timber Resources.

Yellow pine is the only commercial species on the area.

National Forest	260,000,000	ft. B.M.
Private	180,000,000	ft. B.M.

In general, the privately owned timber is of better quality than the government timber. It is believed that the present sale value of the government timber is about \$3.00. The Forest Service can sell this timber in less than 10 years, and perhaps very much sooner than this if the owners of the intermingled private timber become further alarmed over the beetle losses, and if the government stumpage price is put considerably below \$3.00.

III. Past Losses and Present Infestation.

In September, 1917 a fire burned over an area of 18,000 acres of National Forest timber and 6,000 acres of private timber. The yellow pine timber killed by the fire was estimated at that time to be 72,000,000 board feet for the government timber, and 24,000,000 board feet for the private timber. Subsequent to the fire and even to the present time, Dendroctonus brevicornis has been killing considerable scorched and uninjured yellow pine on this burn which is known as the Flat Top burn. This burn is included in the east half of the proposed insect control project.

On the entire project area, the western pine beetle has killed at least 15,000,000 board feet of government timber, and 10,000,000 board feet of private timber during the 6-year period, 1918-1923 inclusive.

On the burn, the present infestation is in the nature of scattered, individual trees, while outside of the burn,

group infestation is the rule. However, there is no marked difference in the severity of the existing infestation on the burn and outside of it. Again and again, sections will be found where the overwintering infestation, one-half of the 1923 loss, amounts to 60 and 70 trees per section with an average volume of 700 board feet per tree.

In an examination of the project area in 1922, the writer believed that there were evidences of a considerable and an immediate decline in the infestation. In the examination in October, 1923, it was evident that the decline did not materialize.

For the project area as a whole, the overwintering infestation will average 40 trees per section, averaging slightly over 700 board feet per tree. With this estimate as a basis, the existing infestation is as follows:-

National Forest	2,400 trees	1,700,000 bd.ft.
Private	1,400 trees	1,000,000 bd.ft.

The future progress of this infestation, in the absence of control work, cannot be safely predicted. It is true, however, that the 1923 losses are as heavy as the 1922 damage, and that the condition of the larvae in the infested trees indicate the possibility of maintenance of insect activity on the present scale.

IV. Cost and Desirability of Control.

The expenses of control work in this area will be increased by the relatively long distance to Bend, the chief source of supplies and labor. The lack of water in the area will necessitate hauling of water for camp use from Indian Springs and Cabin Lake Ranger Station. The area has an abundance of passable roads. The level character of the area and the frequent lack of natural reproduction will tend to partially offset the unfavorable cost factors. It is estimated that control work will cost \$4.75 per thousand board feet. With this as a basis, the 1924 control operations will cost as follows:-

National Forest	\$8,075.
Private	\$4,750.

Although the private owners are very much interested in the beetle situation on this area, there is at the present writing no definite assurance that they will cooperate in carrying out an effective control program. There is some talk of operating the private timber within the next few years if a favorable stumpage price can be secured from the Forest Service for the National Forest timber. There is a feeling among the private timber owners in the area that the beetle losses in the past, and the probability of their continuance in the future, justify special efforts to log this timber immediately and to pass up for the time being other more accessible yellow pine which is not now badly infested by the western pine beetle.

THE GRADE CREEK PROJECT
on the
CHELIAN NATIONAL FOREST

I. Acreage.

The yellow pine in the project covers less than 10,000 acres, none of which is privately owned. Although the map shows the yellow pine forest extending to the shores of the lake, the commercial and infested yellow pine is in most cases at least one mile back from the shore of the lake.

Higher up on the slopes and immediately adjacent to the yellow pine is an area of about 20,000 acres of lodgepole and white-bark pine, much of which is heavily infested by the mountain pine beetle. This is the area shaded blue on the map.

II. Timber Resources.

The stand of yellow pine in the project area is estimated at 75,000,000 board feet. There is considerable lodgepole intimately in mixture with the yellow pine on which no volume estimate is available.

The timber is of good quality and although there have been several informal inquiries regarding it during the past two years, it is likely that the yellow pine will eventually sell for less than \$3.00. As explained earlier in the report, the remoteness of the timber to manufacturing points and markets is largely responsible for the low value.

III. Past Losses and Present Infestation.

The principal yellow pine infestation is confined to an area of less than 5,000 acres. This infestation is most severe where the yellow pine is in close mixture with infested lodgepole. In such cases, the larger yellow pine trees are often killed by a combined attack of Dendroctonus brevicomis and Dendroctonus monticolae while most of the smaller trees are killed by Dendroctonus monticolae alone. At least 75 per cent of the infested volume on this project is of this intermingled western pine beetle and mountain pine beetle type, and is confined largely to perhaps 2,000 acres in the Coyote Creek, Camas Creek and Grade Creek drainages. On about 3,000 acres there is a scattered brevicomis infestation of considerably more than normal severity. The lodgepole infestation is of great extent. As has been indicated, there is considerable lodgepole which is in close mixture with yellow

pine and which is heavily infested by the mountain pine beetle. In addition to this, there are thousands of acres of almost pure stands of lodgepole and white-bark pine which are severely attacked by the mountain pine beetle, and which immediately adjoin the yellow pine timber in the manner shown on the map. What inter-relationship there is between the mountain pine beetle attacks in the lodgepole and those in the yellow pine is a matter of considerable moment in deciding on the feasibility of this project.

It is estimated that in 1921 and 1922, at least 1,500,000 board feet of yellow pine were killed by the attacks of the mountain pine beetle and the western pine beetle. Of this amount, perhaps 1,000,000 board feet of yellow pine were killed by the mountain pine beetle as the primary insect, although some western pine beetle work was present. In the remaining 500,000 board feet, the western pine beetle was the primary insect.

It is estimated that the overwintering mountain pine beetle and western pine beetle in yellow pine amounts to 2,400 trees with an average volume of 500 board feet per tree, or a total yellow pine infested volume of 1,200,000 board feet.

There is every evidence that the mountain pine beetle infestation is due for large increases within the next few years. The infestation in lodgepole, for example, represents an increase of several hundred per cent over the previous year's attack. Although the increase of the 1923 attack over the 1922 attack in yellow pine shows no such great enlargement as was the case in lodgepole, there is some basis for believing that the 1924 yellow pine infestation will exceed the 1923 mountain pine beetle infestation in yellow pine if no control operations are undertaken during the spring of 1924.

IV. Cost and Desirability of Control Work.

The recommendation of the Grade Creek project is based on the assumption that the Bureau of Entomology will recommend control work only in yellow pine, in accordance with the host selection principle developed by Dr. A. D. Hopkins. The lodgepole is of little present value and the sole justifiable purpose of the initiation of this project is the protection of the yellow pine against further inroads by the mountain pine beetle and the western pine beetle.

Because of the extreme concentration of most of the infestation in this project, it is believed that the control

work in yellow pine can be done for \$4.00 per thousand board feet, in spite of the handicaps of somewhat unfavorable topography, distance from base of supplies and labor, and cost of transportation of men and supplies into the infested area. Using \$4.00 per thousand board feet as a basis, and assuming an infested board foot yellow pine volume of 1,200,000 board feet, the cost of the control operations in the spring of 1924 is \$4,800.

THE CRATER LAKE NATIONAL PARK-

UMPUQUA NATIONAL FOREST PROJECT

The following extracts of letters of Colonel C. C. Thomson, Superintendent of the Crater Lake National Park, to the Director of the Park Service indicate the basis on which Colonel Thomson has recommended the appropriation of \$15,000 in the fiscal year 1924, and an additional \$15,000 for the fiscal year 1925:-

November 16, 1923.

"As you are aware, insects have been attacking our lodgepole pines during a period of about ten years with the result that the stand in the northeast section of the Park, from the rim of the Lake to the Park Boundary, is now sadly decimated and presents a sorry spectacle. This involved area embraces some thirty square miles in which a considerable proportion of the trees have been killed. In some districts in this area the insect activity was excessive, relatively small acreages showing thousands of dead trees from certain points on the rim road between the Watchman and Grouse hill so that the prospect now is a dismal stretch of dead trees as far as the eye can reach.

"And the end is not yet. This summer I spent some time investigating the condition and found that the cycle of activity is still upward. The infestation is spreading westward and northward, the pest having already invaded the trees to a point considerably west of the Crater Lake-Diamond Lake road. In the timber surrounding the Desert the beetle is already rapidly destroying the best trees. It is also working southward: several trees have been destroyed at Anna Spring; Government Camp is slightly infested; traces of activity show scatteringly down almost the full length of the Klamath road to the southern border and trees are being attacked westward as far as the Castle Creek Canyon at the west entrance.

"These evidences of destruction are symptomatic of what is going on in the Park and doubtless an investigation by trained entomologists would reveal far more. This is enough and more than enough to show that a situation exists that can no longer be neglected."

December 16, 1923.

"In our last annual report and in two monthly reports, I have called attention to the menace presented to this Park by insect infestation of our timber. I desire now to bring this matter to your attention in greater detail and to urge that prompt and specific action must be undertaken.

"I have called into conference entomologist Patterson of the Department of Agriculture stationed at Ashland, Oregon, and also Mr. H. B. Rankin, Forest Supervisor of this district. Later Mr. Rankin brought in entomologist Jaenicke of the District Forester's office. This communication to a great extent covers their estimate of the situation as well as my own.

"Another species of beetle has attacked a few of the yellow pines along the southern border of the Park but this is not considered a menace at the present time. The Lodgepole Pine infestation is the serious one, not only in view of the havoc already created but because a very large proportion of our timber is Lodgepole Pine. Its relative lack of value commercially is of no significance as to us it is invaluable recreationally, as a cover, for its soil-making value where it grows out of volcanic ash and pumice, as a forest shade. Without our Lodgepole Pines this Park would be largely a wind-blown, sandy desert.

"Keenly feeling that this problem is one of too grave responsibility for me to share I am again stressing its importance to you with urgent recommendation that the situation be laid before Congress with a request for funds for control work. It is recommended that \$15,000.00 be made available for the work next year, continuing with a similar amount in 1926. For this sum it is estimated that the insect can be controlled to the desired degree within the Park.

"It must be pointed out, however, that to be permanently effective, control work must be undertaken within the adjacent National Forests. The Umpqua, adjoining us to the north, is infested, the insect having worked considerable destruction in the recreational area around Diamond Lake. This area, of course, is outside our present responsibility but its involvement further menaces the Park.

"If funds are made available for the purpose the work will be done under the personal direction of a field man from the Bureau of Entomology. There is no grounds for hope that the menace will abate through natural causes and if permitted to go unchecked must bring about a devastation that would be unthinkable in a scenic area set aside for perpetual protection by the richest Government on earth."

The data secured by Mr. J. E. Patterson of the Bureau of Entomology's forest insect station is summarized in the following paragraphs:-*

"Recently Colonel Thomaon, Superintendent of the Crater Lake National Park, called the writer into conference regarding the present forest insect conditions in this Park. As a result of this conference Colonel Thomaon prepared a memorandum to the Director of the National Park Service asking that an appropriation of \$15,000 be made available for the ensuing fiscal year to start adequate control work in the Crater Park and that a like amount of funds be continued for 1926 to continue the work. He also made the request that the matter be taken up with the Forest Service to secure cooperation with the Umpqua Forest and that a representative of the Bureau of Entomology be assigned to the project in an advisory capacity. With the concurrence of the writer it was proposed that this station cooperate with the Crater Lake Park in a survey of the infested areas next spring if funds are available to definitely ascertain the extent, character, and amount of the infestation, as a basis for proposed control work.

"In August 1923 the writer and his assistant, Mr. F. D. Sergeant, made a preliminary examination of the lodgepole pine forest between Crater Lake and Diamond Lake. This examination revealed the fact that an epidemic of the mountain pine beetle, Dendroctonus monticolae, existed in the lodgepole stands throughout the northern and eastern portions of the Park and also throughout the southern portion of the Umpqua National Forest. This infestation occurs in local centers but is generally distributed over an area estimated as approximately 60 square miles. Approximately one-half of this area lies in the Crater Park and the rest in the Umpqua Forest. The magnitude of the infestation was made apparent by the examination of three

*Extracted from January 1 issue of News Letter of Western Division of Forest Insect Branch of Bureau of Entomology.

large centers in the plateau region between Mt. Thielson and Lla-o Rock. These infested areas consisted of about 500 acres each with probably 5,000 infested trees each. A conservative estimate of the 1923 infestation on the 60 square miles infested area above mentioned is placed at 75,000 lodgepole pine trees infested with Dendroctonus monticolae. One peculiarity noted in this infestation is its occurrence in local centers or large groups; some of these groups are separated one or more miles from any other infestation. Between these centers it was hardly possible to find a single infested tree. Another feature, which differs from some other well known infestations of the mountain pine beetle in lodgepole pine, is the absence on this area of any other primary forest insect. It is purely an epidemic of the mountain pine beetle in healthy lodgepole pine without any other insects involved. The attacked trees range from 3" to 20" in diameter.

"Dead trees, some standing and some down, that were examined proved that this infestation has been in progress for at least ten years. It is increasing, however, and spreading from the old centers as was noted from many points on the Rim Road around Crater Lake. The small centers noted from these points in 1921 have enlarged and spread until the present infestation on the eastern and southern slopes of Mt. Thielson is one continuous red and black forest. Recently a few trees were infested at Government Camp on the opposite side of the lake from the above areas. A heavy center has also developed around the Lodge on the north side of Diamond Lake and small centers were noted on the west slopes of the Cascades in the Crater National Forest. As is usual in these infestations, centers develop around campsites where they are most conspicuous. This is due to the attraction of the beetles to campfires maintained at these places during the flight period. This infestation has not yet reached its peak in the present cycle but is still increasing at a high epidemic rate.

"It is the opinion of the writer that this infestation can be controlled by Bureau of Entomology methods, provided a project can be inaugurated sufficiently comprehensive in extent to include all the heavily infested areas within the Crater Lake Park and the adjoining National Forests. One disadvantage which would be encountered is the short working season in the altitudes of the infested areas. These range from 5,000 to 8,000 feet. It would be impossible to get into the areas before May 1st which would permit only a short working period in the spring. Possibly the fall season would offer a longer working period which could start immediately after the annual infestation had settled in the attacked trees."

The general data secured by the writer in October, 1922, and October, 1923, agree entirely with Mr. Patterson's observations. Considerable infestation in lodgepole in the nature of scattered small and large centers is in progress in the extensive lodgepole pine forests north of Diamond Lake in the region shaded in blue on the accompanying map. The feasibility of control work seems to hinge largely on the practicability of cleaning up the infestation centers east, west, and south of Diamond Lake, and preventing the spread of the infestation from the forests north of Diamond Lake into the cleaned areas. However, this is an entomological matter for the Bureau's decision.

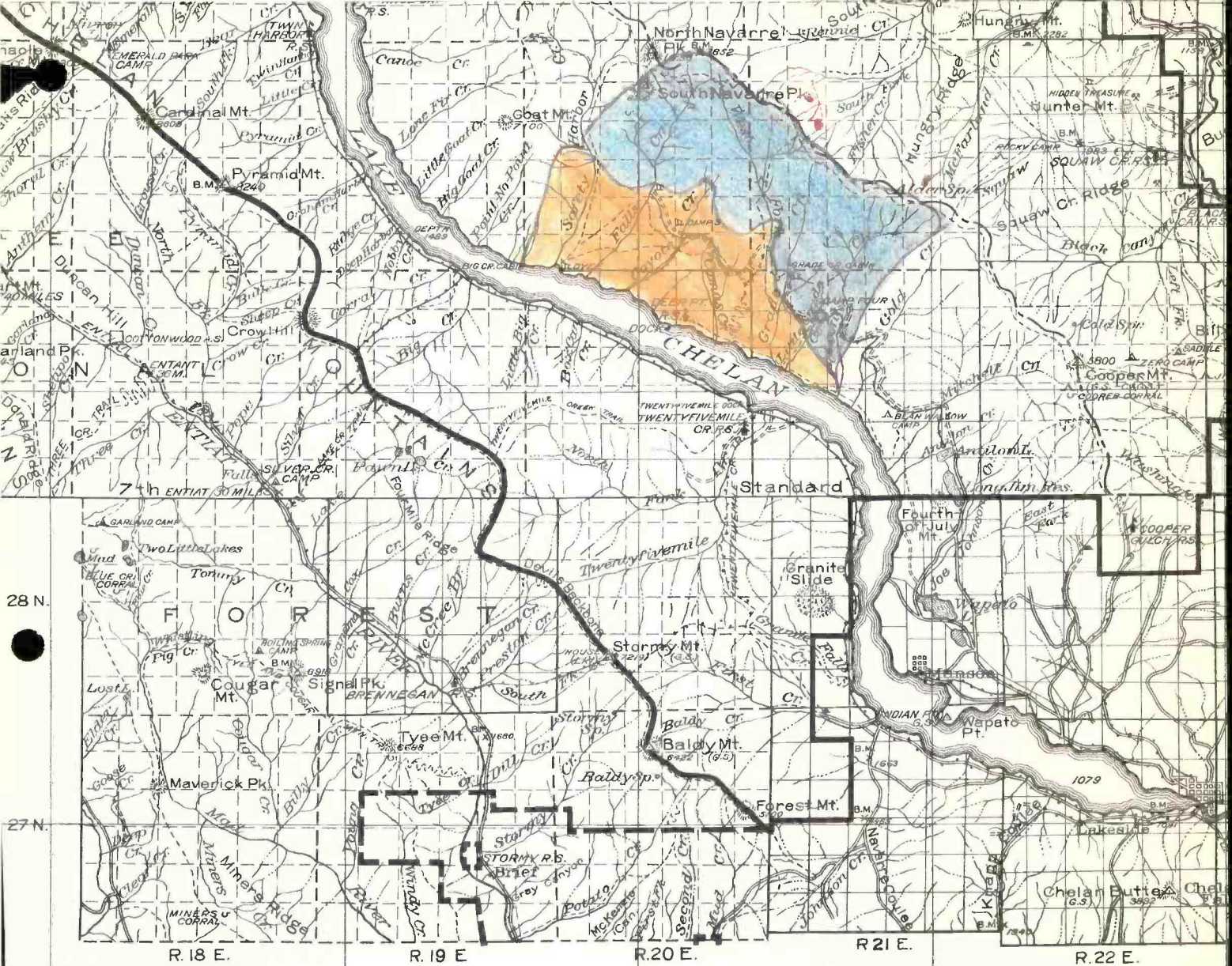
There are scenic values around Diamond Lake which need protection from further extension of the infestation which are fully as important as those which are jeopardized in the northeastern part of the Crater National Park.

OTHER PROJECTS

Directly south and southeast of the proposed Metolius project on the Deschutes is a yellow pine forest of high value and good accessibility which is being damaged to no inconsiderable degree by the western pine beetle. A large part of the timber is in the nature of scattered private holdings. At the present time, there does not seem to be any immediate prospect of securing the cooperation of the timber owners in carrying on control work. For this reason, the project is not recommended now. However, it will probably be included in the projects proposed for 1925. A preliminary survey of the situation indicates that the government share of this project will be at least \$6,000, unless a material decline in the severity of the infestation takes place during 1924.

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MAPS
TO
ACCOMPANY REPORT
OF
DECEMBER 20, 1923.
ON
PROPOSED INSECT CONTROL PROJECTS
IN
DISTRICT 6



U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
W. B. GREELEY, FORESTER

CHELAN NATIONAL FOREST

WASHINGTON

WILLAMETTE MERIDIAN

1922

Longitude West from Greenwich

40'

30'

20'

10'

120'

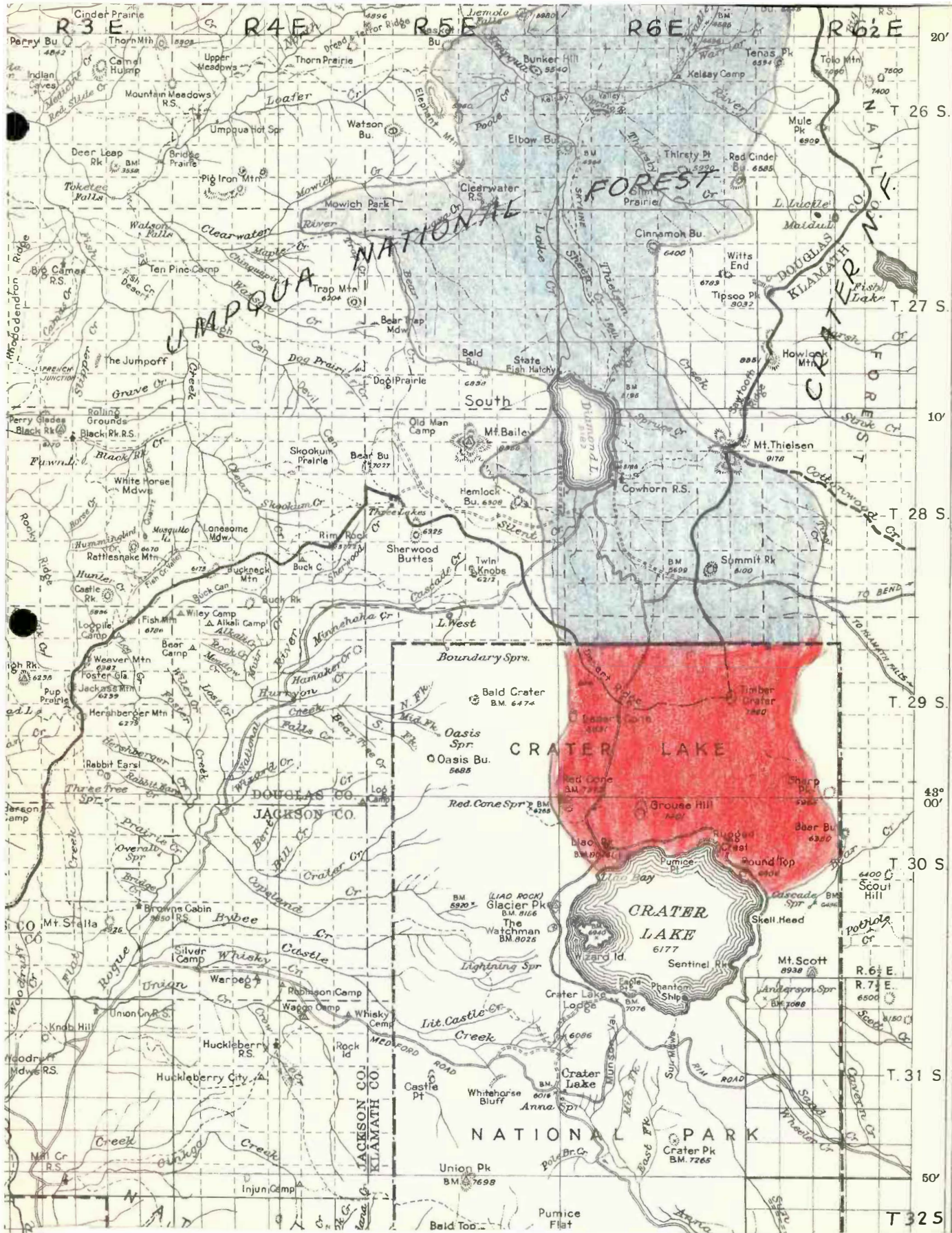
PROPOSED GRADE CREEK PROJECT



Yellow Pine infestation



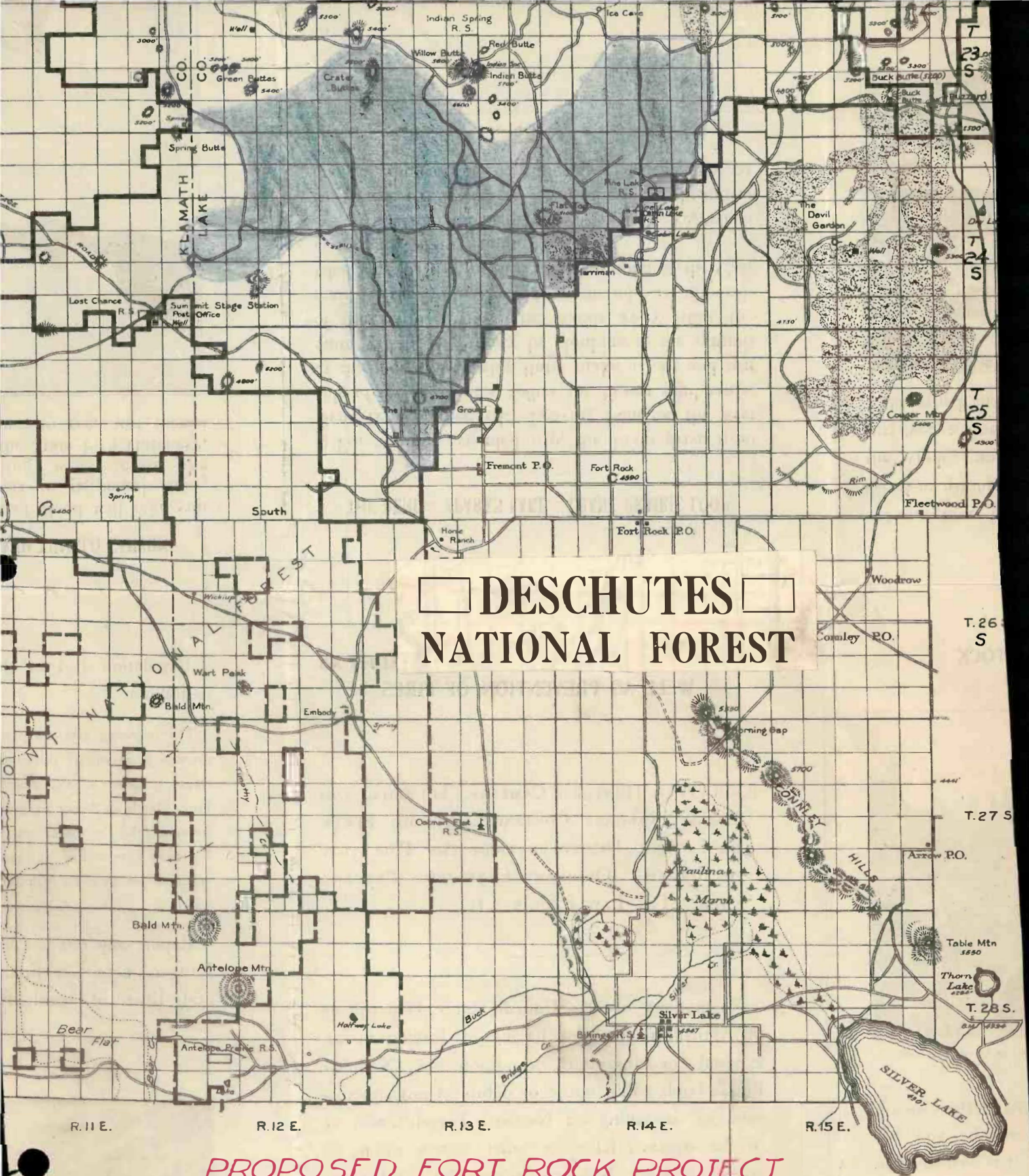
Lodgepole and white-bark
Pine infestation



PROPOSED CRATER NATIONAL PARK-UMPUQUA PROJECT

Crater Lake National Park, partially infested lodgepole

Umpqua and Crater National Forest, partially infested lodgepole



PROPOSED FORT ROCK PROJECT



Infested private and National
Forest yellow pine area



From here B
excellent fishing
the whole sum
surveyed a num
Lake, which ma

For a more extended trip, the Loop drive from Bend is recommended. Leaving Bend on the west side of the Deschutes, follow the Forest signboards; at the foot of Bachelor Butte make a halt and rest your walking endurance by climbing to the summit of the butte. This butte stands away from the main Cascade divide and commands an unparalleled view of the magnificent panorama of the Cascades and Paulina Mountains.

Not far from Bachelor Pass is Todd Lake, which is considered by many to be the most beautiful lake of the region. Fishing is excellent here at certain seasons.

THE BEND—SPARKS LAKE—CRANE PRAIRIE LOOP

YOU ARE INTERESTED IN PUBLIC HEALTH AS WELL AS PREVENTION OF FIRES

EACH YEAR HUNTERS, CAMPERS, TOURISTS, AND FOREST RANGERS CONTRACT TYPHOID FEVER OR ENTERIC DISORDERS FROM THE POLLUTION OF STREAMS. ORDINARY CARE WILL PREVENT THEM. THE LAW REQUIRES IT.

Regulations of the United States Department of Agriculture prohibit having or leaving in an exposed or insanitary condition on National Forest lands camp refuse or debris of any description, or depositing on National Forest lands, or in the streams, lakes, or other waters within or bordering upon National Forests, any substance which pollutes or is likely to cause pollution of the said streams, lakes, or waters.

Section 114 of the laws of Oregon says:

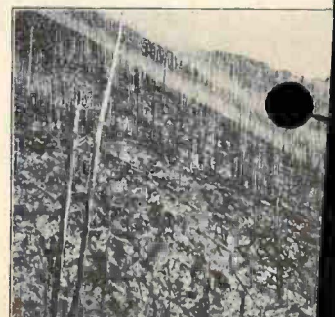
of Bend will take you
the State Fish Hatchery,
ing west across the
sert to perpetual snow.

AND TUMALO CANYON

Regulation P-4 of the
as follows:

The following acts are prohibited:
exposed or insanitary condition
refuse or debris of any description
Forest lands or being or going
streams, lakes, or other waters
National Forests any substance
or are liable to cause pollution
waters.

Report any offenses to the
Ranger or to Dr. Fred
State Board of Health, P



TOCK



ich an annual fee is paid
ons of the Cascade
months you will
It is well to know
there under permit
llowed in order to
wise go to waste
ould constitute a

122°

PROPOSED METOLIUS PROJECT

 Infested Yellow Pine area

T.10S.

T.11S.

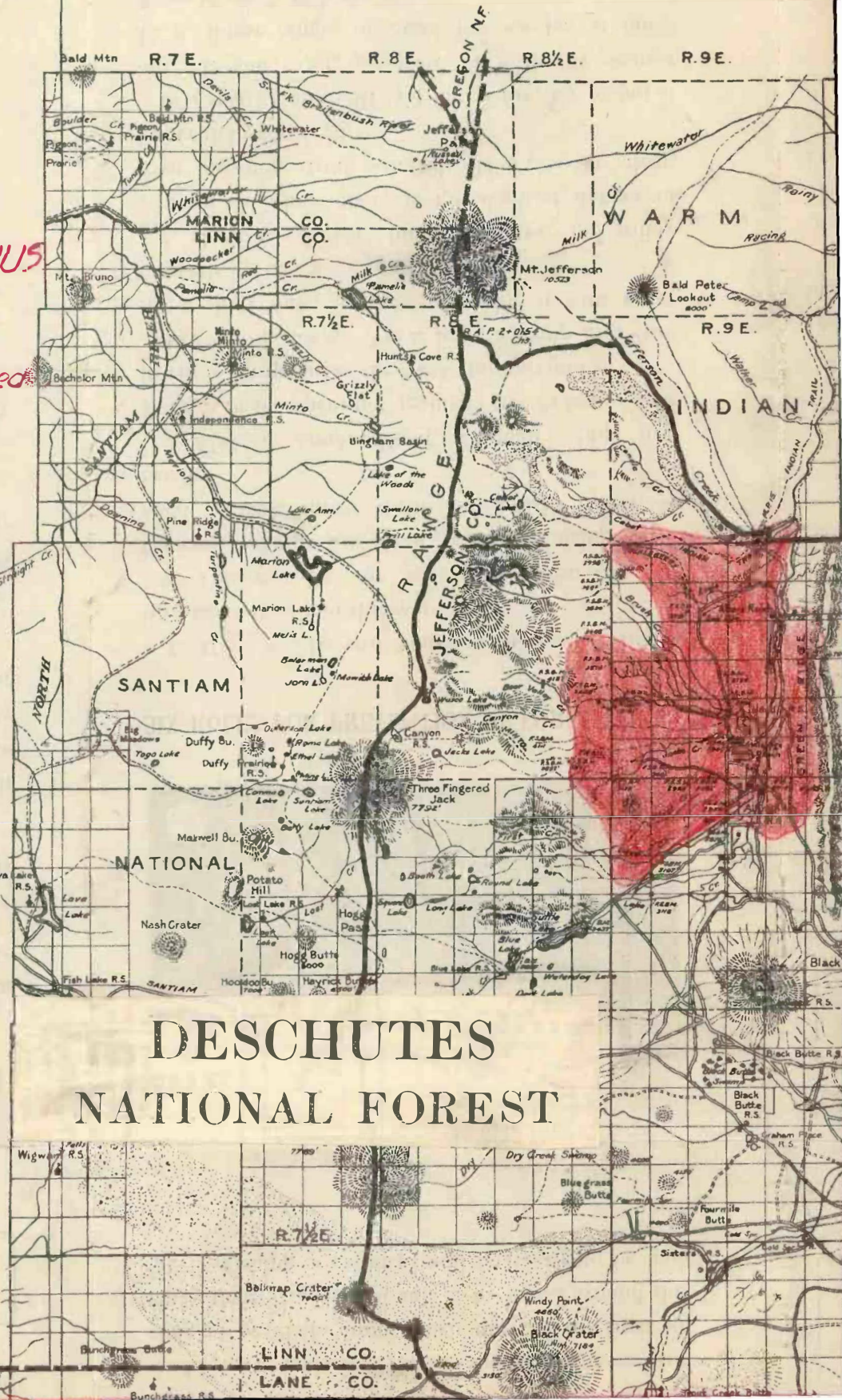
T.12S.

T.13S.

T.14S.

T.15S.

DESCHUTES NATIONAL FOREST



to Eugene, or south, via Crescent to Diamond Lake.

*... will insure a sanitary camp and prevent
The law requires it.*

(7)

RULES FOR SPORTSMEN

sportsman.—There is more honor in
ne a square deal than in getting the

... it's a buck.—If you can't see his
sn't got any.

enforce the game law.—Game and fish
perty, and only a game hog will take
is fair and legal share. Violations
orted to the nearest deputy warden,
or game protective association.

he ranchman's property.—He regards
leaves his gates open, cuts his fences,
e stock, or shoots near his dwellings,
Put yourself in his place.

l with your camp fire and matches.—
make a million matches; one match
lion trees.

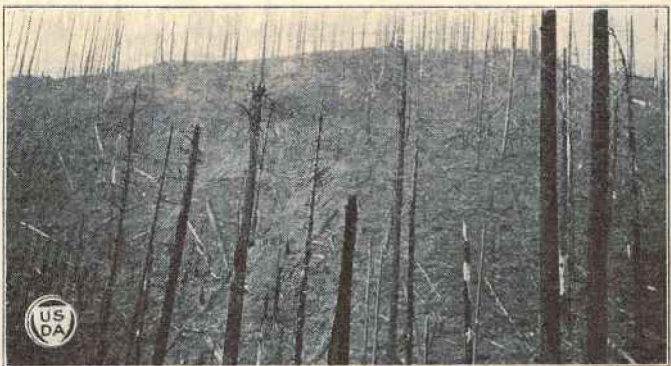
clean camp and a clean record.—Un-
e, crippled game, and broken laws are
nts for a sportsman to leave behind

the trees around the camping ground, you will
ing on a woodpile instead of in a cool, clean

(12)

ained by the Forest Service. One could spend
weeks here exploring the crater, where there are
cliffs of obsidian, from which the Indians used to
make their arrowheads, still to be found around the
lake. Fishing is excellent and boats are to be had

(8)



Burned timber builds no homes nor furnishes recreation.

SIX RULES FOR PREVENTION OF FOREST FIRES

1. *Matches.*—Be sure your match is out. Break
it in two before you throw it away.

2. *Tobacco.*—Be sure your pipe ashes, cigar or
cigarette stumps are dead before throwing them
away. Don't throw them into brush, leaves, or
needles.

3. *Making camp.*—Build a small camp fire.
Build it in the open, not against a tree or log or near
brush. Scrape away the trash from around it.

4. *Leaving camp.*—Never leave a camp fire, even
for a short time, without quenching it with water
or earth.

5. *Bonfires.*—Never build bonfires in windy
weather or where there is the slightest danger of
their escaping from control. Don't make them
larger than you need.

6. *Fighting fires.*—If you find a fire, try to put it
out. If you can't, get word of it to the nearest
U. S. forest ranger or State fire warden at once.
Keep in touch with the rangers.

*It's your National Forest and your playground—help
protect it from fire.*

(13)